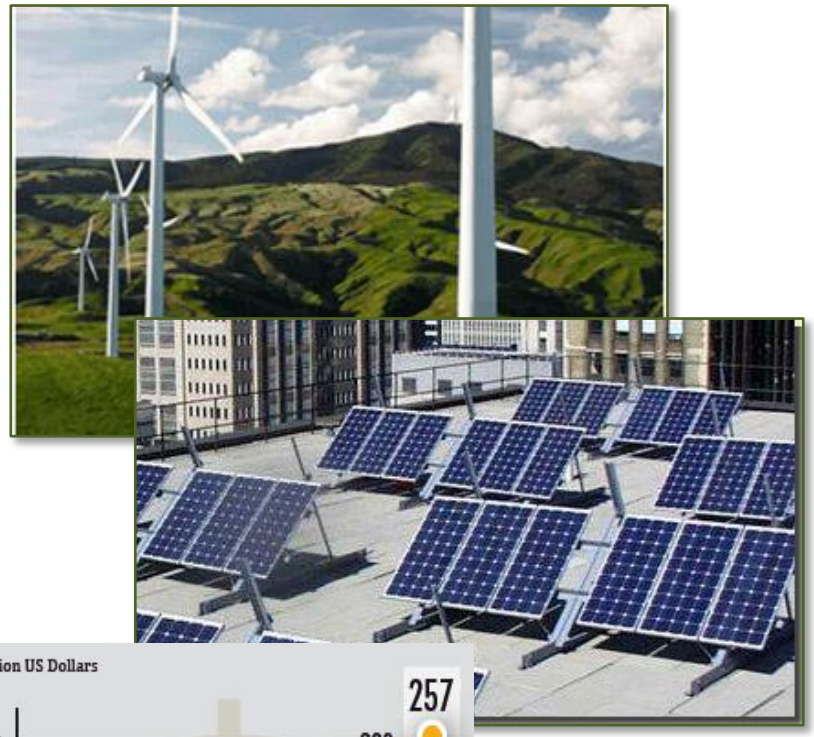
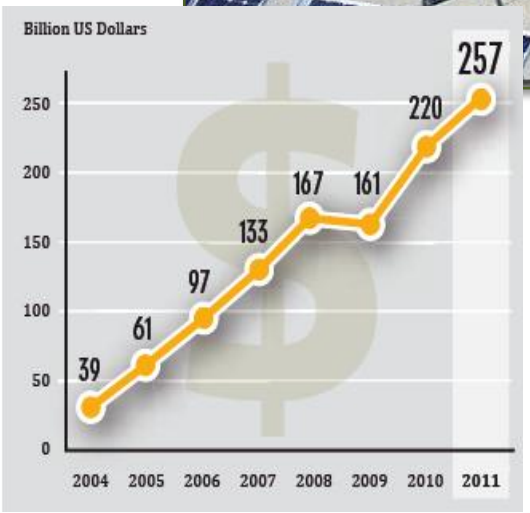


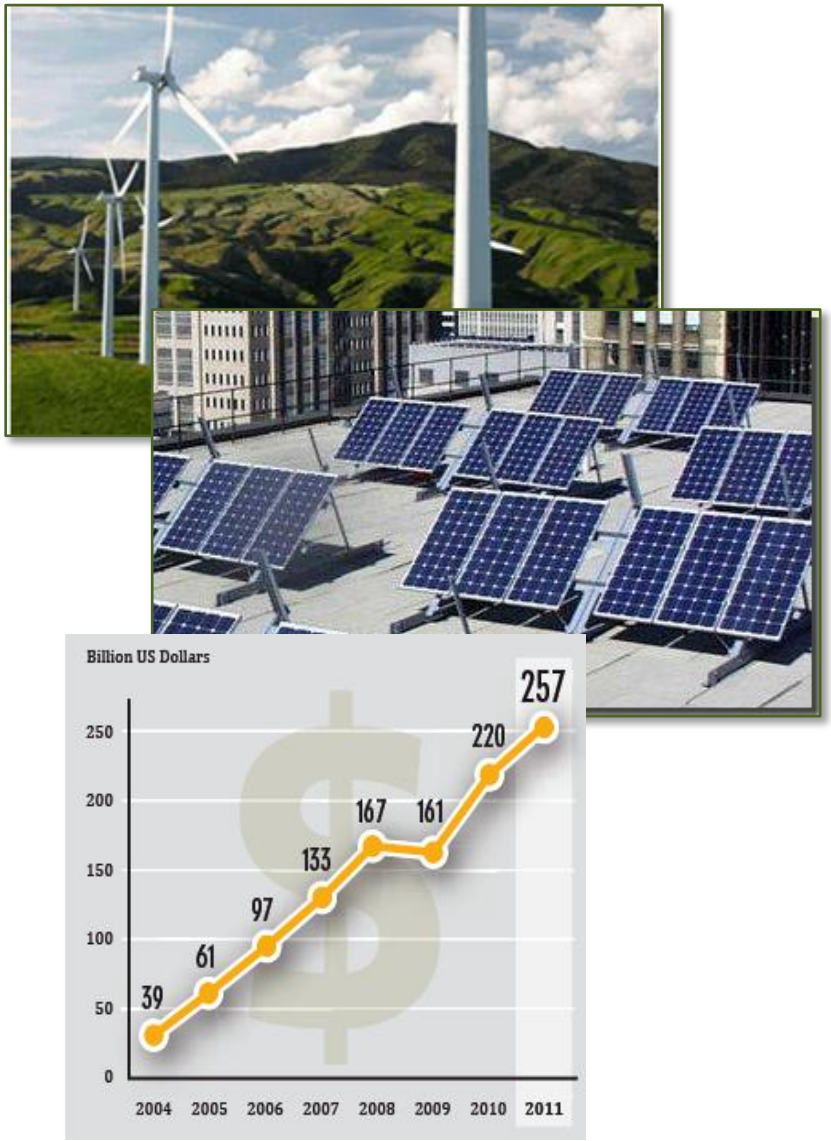


Policy Instruments for Renewable Energy: An Introduction

Pablo Benitez, PhD
World Bank Institute, Climate Change Practice
World Bank

ESMAP/IFC Renewable Energy Training Program
September 18th, 2012
World Bank

Presentation Overview

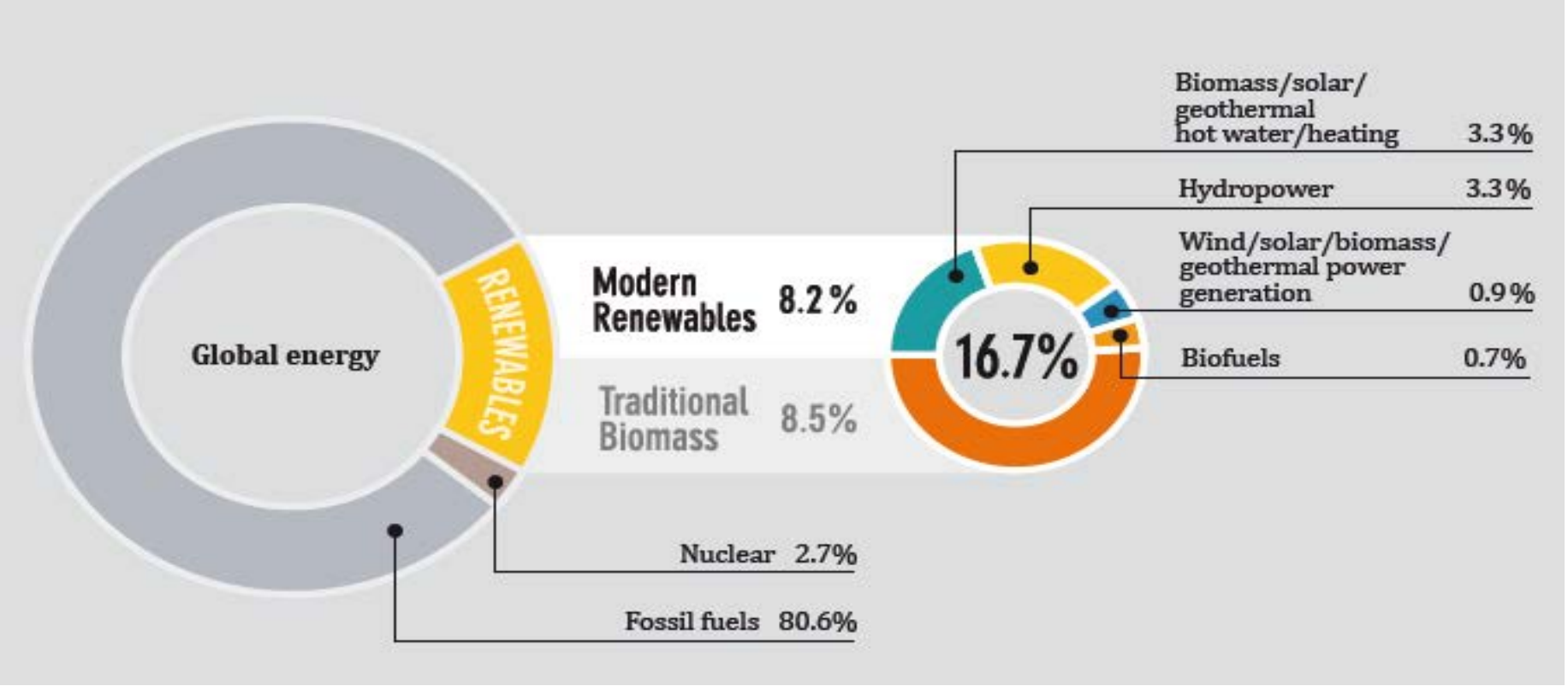


This introductory presentation discusses:

1. Global Renewable Energy Trends
2. Broad Overview of Policy Instruments for RE
   - Regulations and Standards
   - Quantity Instruments
   - Price Instruments
   - Procurement Policies
   - Auctions
3. Policy Design and Lessons Learned

Overview of Renewable Energy

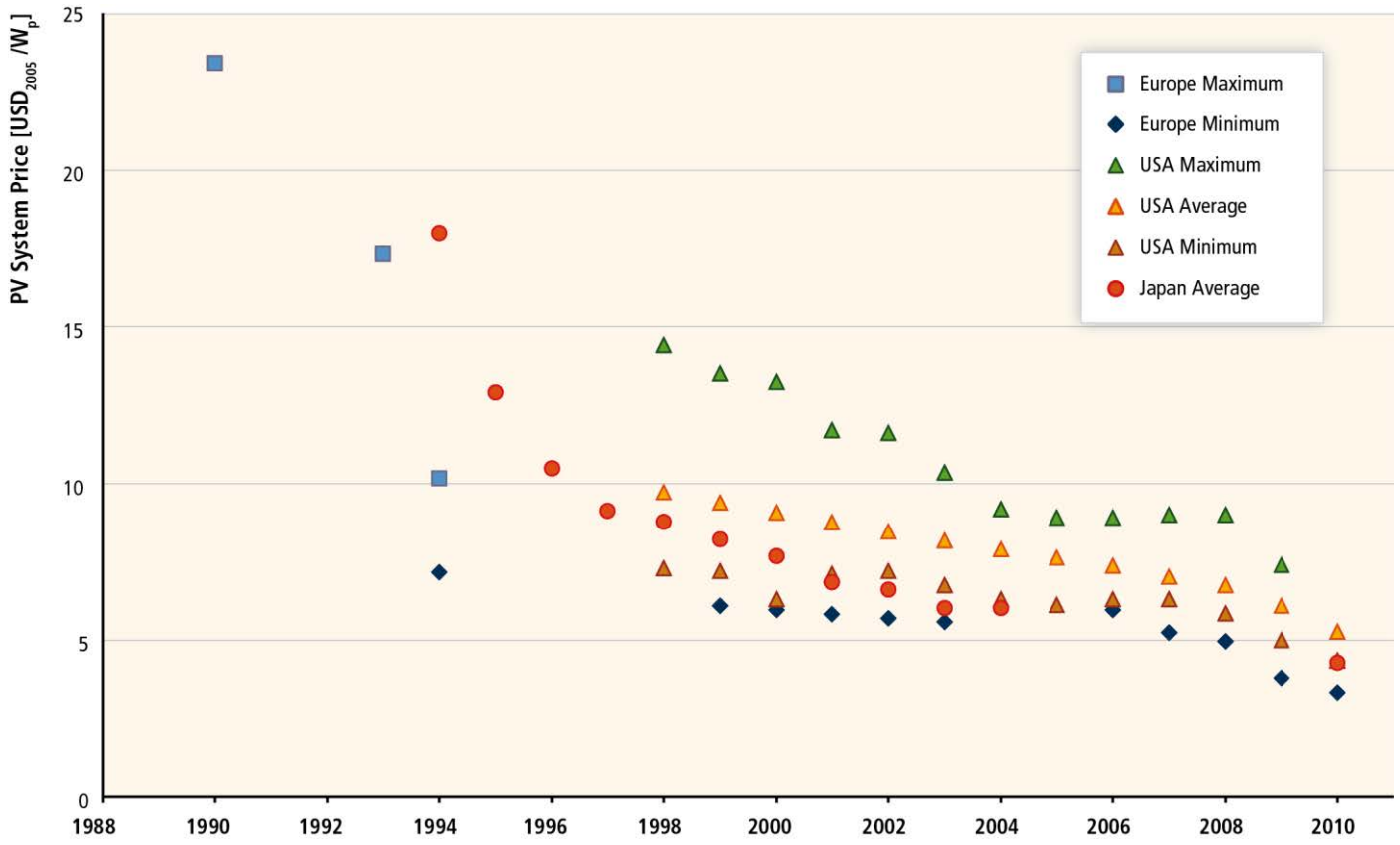
Currently, renewable energy constitutes less than one-fifth of the global energy supply mix (~17%), but is the fastest growing component



RENS21 (2012)

Overview of Renewable Energy

The Costs of Renewable Energy are decreasing….



IPCC (2011)

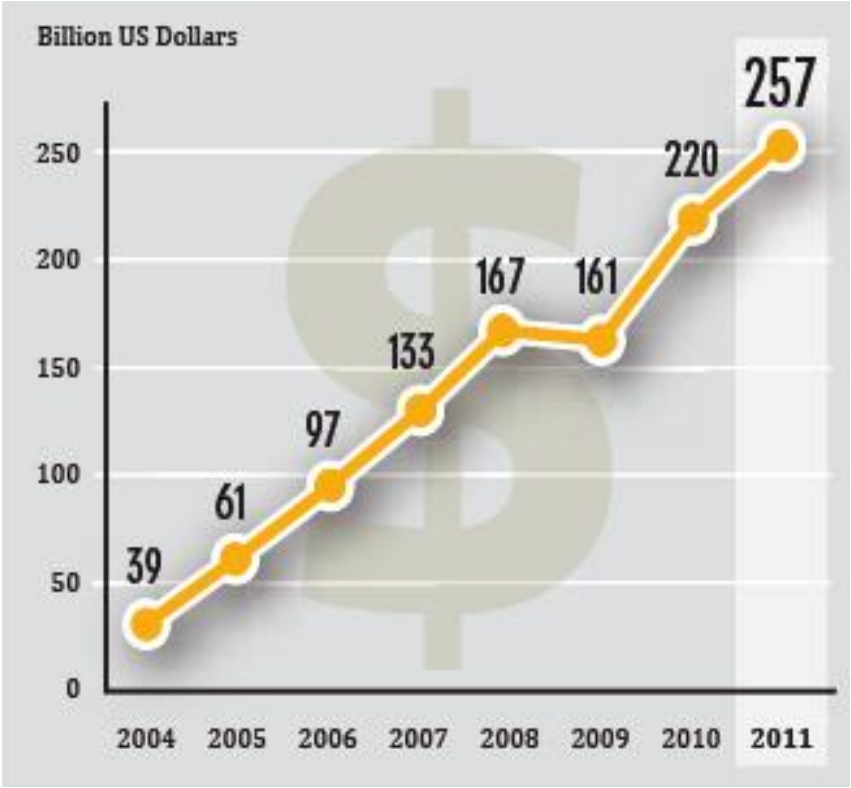
Overview of Renewable Energy

Renewable Energy Capacity and Investment is increasing…

Between 2000 and 2011, the global capacity of wind power increased from 17.4 GW to 238 GW.

In 2011, Renewable Energy investment was greater than investment in natural gas

Global New Investments in Renewable Energy, 2004 to 2011

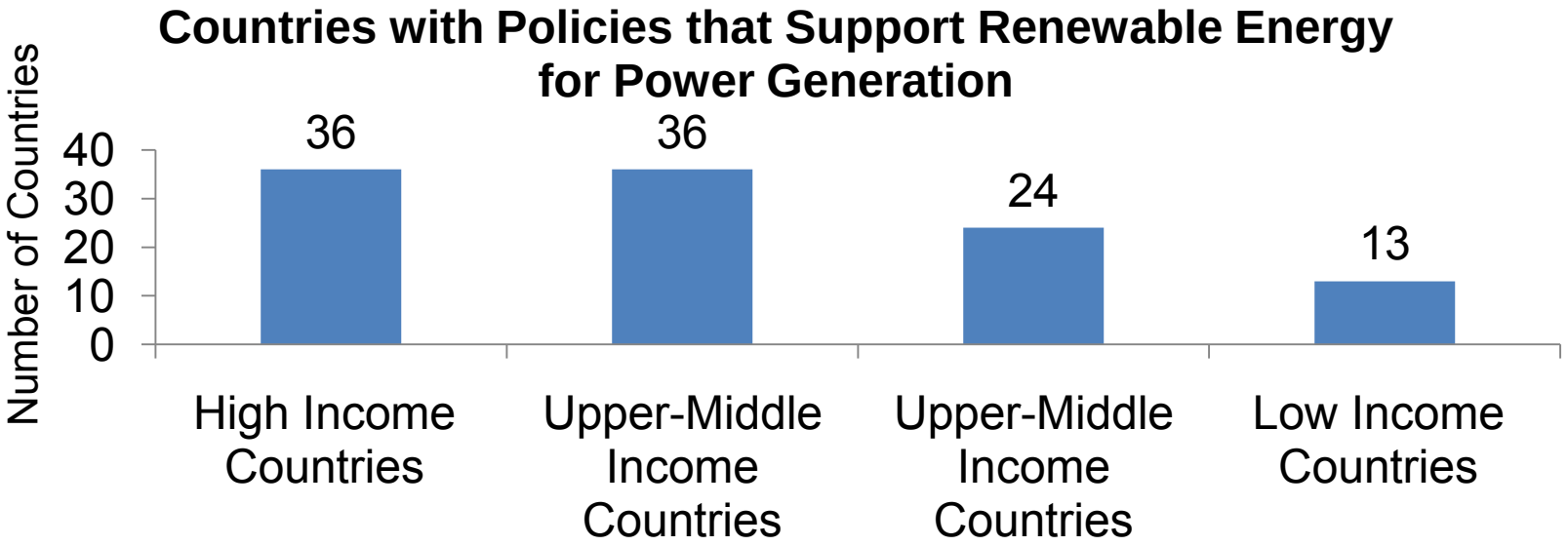


RENS21 (2012)

Overview of Renewable Energy

Renewable energy polices worldwide have facilitated development

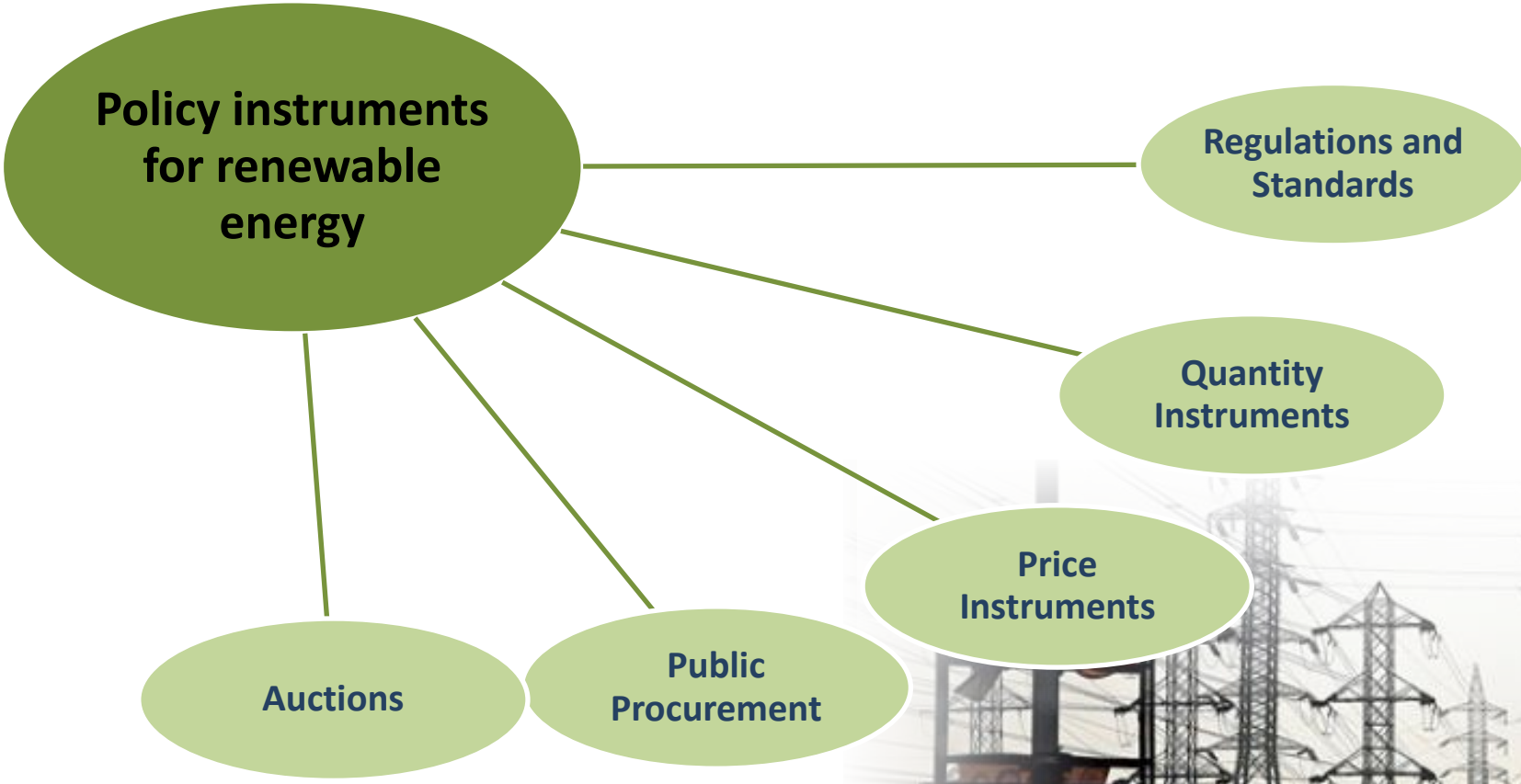
In early 2011, 118 countries had some type of policy target or renewable support policy at the national level.



(REN21, 2012)

Renewable Energy Policies

Policy instruments are "means by which policy objectives are pursued"



Regulations and Standards

Regulations and Standards can promote renewable energy via:

Direct support

Policy Objectives:
removal of non-economic barriers,
increase demand for renewable energy

Indirect support

Policy Objective:
restrictions on fossil fuel power

Policy objectives can increase the attractiveness of renewable energy relative to other power sources.

Example Policies:

1. Renewable Energy Mandates

Solar hot water mandates require a certain energy share or equipment requirement for a building to come from renewable energy sources

2. Flexible Grid Access

Net Metering allows a two-way flow of electricity and only charges consumers for their net electricity use.

Quantity Instruments

Quantity instruments….

market-based instruments that define a specific target or absolute quantity for renewable energy production

Two main types:

1. Renewable Portfolio Standards
2. Renewable Energy Credits

Renewable Portfolio Standards

…Renewable electricity standards
…Renewable obligations
…Mandated market shares

RPS policies provide an explicit target for renewable energy (e.g., 20% renewable energy by 2020)

Renewable Energy Certificates (REC)
…are a non-tangible, tradable commodity that represent proof that one megawatt-hour (MWh) of electricity was generated from a renewable energy resource

Can be bought and sold bundled with electricity or unbundled.

Implemented in combination with RPS

Price Instruments…

reduce cost and pricing-related barriers by establishing favorable price regimes for renewable energy relative to other sources of power generation

Fiscal Incentives

Feed-in Tariffs

Price Instruments…

reduce cost and pricing-related barriers by establishing favorable price regimes for renewable energy relative to other sources of power generation

Fiscal Incentives

- Production/Investment tax credits
- Capital subsidy, grant, or rebate
- Public investment, loans, or grants
- Increase in taxes on fossil fuels
- Reductions in sales, energy, CO2, VAT, or other taxes

Feed-in Tariffs

Feed-in Tariffs

The design of FIT policies typically involves three key provisions:

- **A preferential tariff**
- **Guaranteed purchase of the electricity produced for a specified period**
- **Guaranteed access to the grid**

Feed-in Tariffs

The design of FIT policies typically involves three key provisions:

A preferential tariff

Guaranteed purchase of the electricity produced for a specified period

Guaranteed access to the grid

There are several types of FiT tariffs that vary over the following characteristics:

1. Technology-neutral vs. specific
2. Flat vs. stepped tariffs
3. Fixed vs. premium tariffs
4. Constant over time vs. declining

Feed-in Tariffs

The design of FIT policies typically involves three key provisions:

- **A preferential tariff**
- **Guaranteed purchase of the electricity produced for a specified period**
- **Guaranteed access to the grid**

A purchase obligation ensures that energy suppliers are obliged to buy the power generated by renewable energy projects.

In many cases this contract stability has been critically important, often even more important than the tariff itself in attracting project investors.

Feed-in Tariffs

The design of FIT policies typically involves three key provisions:

- **A preferential tariff**
- **Guaranteed purchase of the electricity produced for a specified period**
- **Guaranteed access to the grid**

Ensuring guaranteed access to the grid so that the power produced by renewable energy projects enter the electricity market also helps reduce project development risks.

Mobilizing Private Capital: Global Energy Transfer Feed-in Tariff (GET FiT)

- While FITs have been demonstrated to be effective, concerns exist over the added tariff in poor nations.
- GET FiT is a proposed solution to leverage international Public-Private Partnerships to support and de-risk national FiTs, using an international fund
- Purpose to mobilize capital by providing financiers Transparency, Longevity, and Certainty

International Public Fund for Renewable Energy Incentives

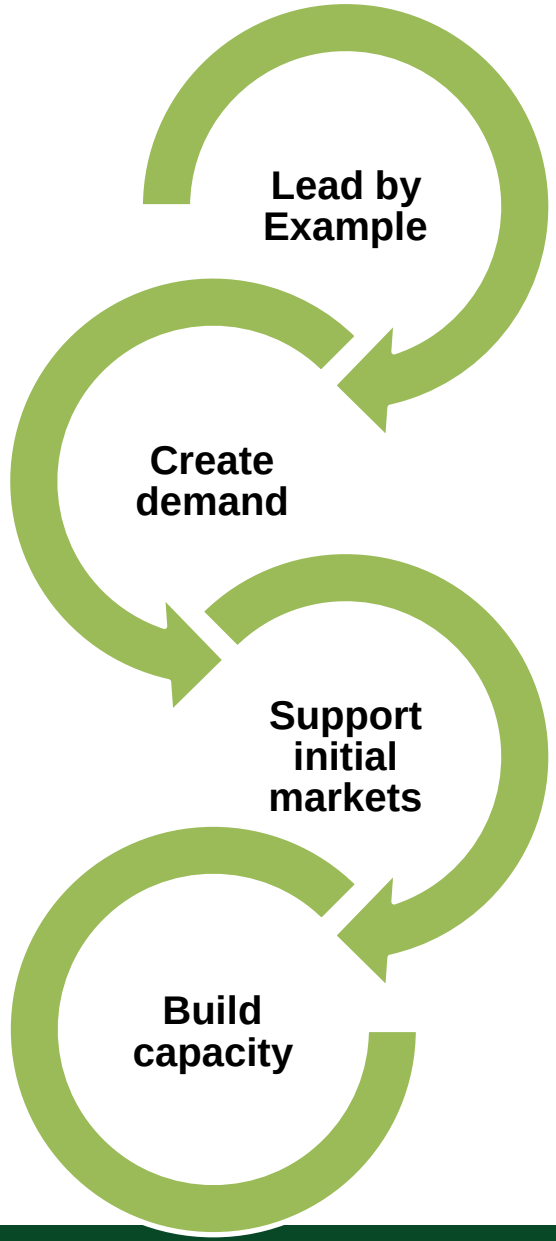
Renewable Energy Risk Mitigation Support

Technical Assistance

(Deutsche Bank, 2010)

Government Procurement

- Governments are often a very large energy consumer
- Government purchasing and procurement decisions affect the market
- Procurement requirements are a tool for national and sub-national governments to mature renewable-energy markets and build capacity



Electricity Auctions

- An auction is a selection process to allocate goods and services competitively, based on a financial offer
  - eg. eBay
- In a ‘reverse auction’, electricity generators bid their supply to distribution companies and the process is designed to select the lowest price.
- Auctions can be used to discover appropriate tariff rate for FiT policy
- Auctions can be a very attractive mechanism for attracting new renewable energy supply

Renewable Energy Policy Design

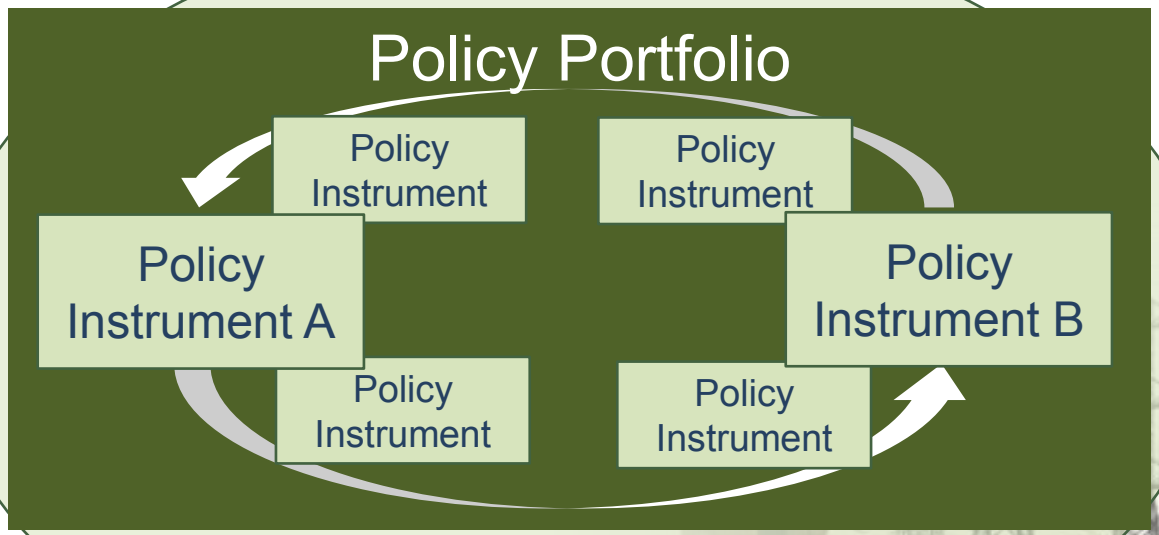
There is no universal policy prescription for supporting renewable energy. — Nations are typically unique. — The most suitable policy instruments in one country may not be appropriate for another country

Instead of a single policy to achieve all of the policy objectives, it is more useful to consider a policy portfolio approach or a policy tool kit.

Renewable Energy Policy Design

There is no universal policy prescription for supporting renewable energy. — Nations are typically unique. — The most suitable policy instruments in one country may not be appropriate for another country

Instead of a single policy to achieve all of the policy objectives, it is more useful to consider a policy portfolio approach or a policy tool kit.



Multiple policy instruments function in a complementary manner

Renewable Energy Policy Design: Criteria for Instrument Choice

Instruments Choice

Environmental Effectiveness	The extent to which a policy meets its intended environmental objective or realizes positive environmental outcomes
Cost-Effectiveness	The extent to which the policy can achieve its objectives at a minimum cost to society.
Complexity	The complexity of the instruments and whether it creates complex trade-offs between competing policy options.
Distributional Issues	The incidence or distributional consequences of a policy, which includes dimensions such as fairness and equity among others
Institutional feasibility and Political Issues	The extent to which a policy instrument is likely to be viewed as legitimate, gain acceptance, adopted and implemented
Government Costs	The amount of government budget required for the policy implementation
Opportunity to Leverage International Funding	The opportunity to leverage international funding for the policy implementation

E-Course and Further Reading

http://einstitute.worldbank.org/ei/course/energy-sector-strategies-support-green-growth

Further Reading

- Elizondo-Azuela, G. and L.A. Barroso. 2011 Design and Performance of Policy Instruments to Promote the Development of Renewable Energy: Emerging Experience in Selected Developing Countries. The World Bank
- IPCC (2011): IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation. Prepared by Working Group III of the Intergovernmental Panel on Climate Change
- REN21 (2012). Renewables 2012 Global Status Report.
- IEA and OECD. 2008. Deploying Renewables: Principles for Effective Policies
- Deutsche Bank (2010). *GET FiT Program*